



Sand Dune and Shingle Network

21st Newsletter, March 2015
Linking science and management

Introduction



Paul Rooney

Director – Sand Dune and Shingle Network

This latest newsletter marks the 'coming of age' of our publication as it is the 21st edition. I founded the Sand Dune and Shingle Network back in 2006, and with John Houston we

have published the newsletter since May 2007. Over the years we have had significant help delivering the Network activities and publications from several assistants including Charlotte Durkin (now Billingham), Fionn Redmond, Mark Whitfield, Tom Marshall and most recently Emily De Noia. As she is about to leave, I wish to thank Emily De Noia for her excellent work as a graduate intern Network Assistant. Emily has been a reliable, self-motivated and skilled member of the team, and we all wish her well in her future adventures.

Back in the May 2007 newsletter we stated that we had 'about 80 people on the network at present and hope to end up with about 150.' Well, almost eight years on we have almost 500 people in the Network. This is quite a success, and proves that there is a sustained demand and need for the Sand Dune and Shingle Network. The support of Network members has been, and continues to be, a crucial factor that in its success. Thank you to everyone who has contributed articles over the years.

In this edition we report on coastal change, both wind and wave induced, and management that is attempting to initiate coastal change. An interest in coastal change underpins the aim of the Network which, put simply, is to conserve sand dunes and shingle as dynamic coastal landscapes. We aim to achieve this aim by helping members to 'link science and management'. Several of the future conferences we report on are significant opportunities for network members to link science and management for the benefit of dynamic coastal environments. We trust that coastal dunes and shingle will feature prominently in these events.

Much remains to be done for the conservation of coastal dune and shingle in Europe. Once again it seems that, although some improvements have been in parts of Europe, the Article 17 reports for the EU Habitats Directive do not paint a good picture for coastal dunes. In countries, including the UK, the overall situation has deteriorated for dunes. Now, more than ever, those of us interested in the conservation of dynamic coastal environments need to share our experience and work together for the improvement of these cherished landscapes.

Network News



Emily De Noia

Network Assistant Intern

Welcome to Issue 21 of the Sand Dune and Shingle Network Newsletter. This is my first full contribution to the newsletter, so I hope you enjoy it. I have enjoyed putting it together, and receiving

the fantastic articles that are included. Thank you to everyone who submitted articles and information for this newsletter.

We all saw how the storms of 2013/2014 altered the coast of England, causing erosion and accretion throughout the British Isles whilst also affecting the coastal habitats and environment. Therefore we are happy to include an article from Jonathan Brownnett, Rachael Mills and Sue Rees in which they assess the coast elevation change caused by the December 2013 storms: 'The use of remote sensing to assess elevation change on the North Norfolk Coast before and after the December 2013 storm surge'. We also have an article from Richard Porter and Ajay Tegala who follow up the December surge from the North Norfolk coast and evaluate the effects upon the wildlife in the area: 'The effect of the December 2013 tidal surge on the wildlife of Blakeney Point'.

Storms affect the coast dramatically, and Hurricane Sandy was no exception. I witnessed the sand dune restoration at Long Beach, New York, following the hurricane; it was interesting to see the effect on the barrier island and the following restoration of the sand dunes and surrounding city. It proved that storms can be catastrophic, especially in barrier island regions, and reinforced the need for coastal protection in the form of sand dunes.

Sadly, my internship has come to an end at the Network; it has been a great experience. From working here, I have furthered my knowledge of sand dune and shingle habitats and feel I have come away with a greater understanding. Not only have I increased my awareness of these vital systems, but I have gained valuable experience which has prepared me for future employment and given me the confidence to apply for a Master's degree in September. I would like to say thank you to Paul and John for helping me during my time at the Network and making it very enjoyable.

If you have any suggestions or ideas for the following newsletter, please do not hesitate to contact us at dunes@hope.ac.uk.

A volunteer survey of Japanese Rose (*Rosa rugosa*) on the Sefton Coast, Merseyside, UK

Philip H. Smith: philmith1941@tiscali.co.uk, **Ben Deed:** ben.deed@merseysidebiobank.org.uk

The May 2007 Newsletter posed the question “Is *Rosa rugosa* (Japanese Rose) a problem species that we should be paying more attention to?” Mounting concern about the recent spread of this non-native spiny shrub on the internationally important sand dune system of the Sefton Coast, north Merseyside, led to a volunteer survey being organised in 2014. It aimed to provide baseline information on the distribution and status of *R. rugosa* that could be used, if necessary, to plan its control.

Forty seven volunteers were recruited to work in teams to search most of the 27 km long coastal zone. Some struggled to find any bushes at all. The only ones located on the National Trust property at Formby Point were associated with a caravan site, an old document revealing that they were part of a 1982 planting scheme. Another team, covering part of the Birkdale frontal dunes, expressed amazement at how much they had found, their recording form listing 165 bushes. At Altcar Rifle Range, some of the patches were so large that the best way of measuring them was to take GPS readings at the four corners. One was 460m long!



Large patch of *Rosa rugosa*, Hightown Sand dunes, Sefton Coast. Phil Smith

Overall, about 500 bushes were recorded covering nearly 6ha. They occurred especially on younger calcareous dunes (soil pH 5.62 – 8.18) near the sea and close to roads and human habitation. Hardly any bushes were found on older, more acidic duneland or on a 5 km erosion front around Formby Point. This pattern of occurrence accords with that reported for *R. rugosa* in Denmark (Jorgensen & Kollman, 2009; Kollman et al., 2009), indicating that the sea is implicated in the dispersion of

propagules and that the species also establishes from anthropogenic sources, including ornamental plantings. A separate study showed that representative patches of *R. rugosa* were growing in size by over 20% per annum.



Rosa rugosa survey, Sefton Coast, June 2014. Phil Smith

It was concluded that this plant is a potential threat to dune habitats and species on the Sefton Coast and that a management strategy may be justified (Smith & Deed, 2014). *R. rugosa* is still widely advertised and sold on the internet and through garden centres. During a November 2014 BBC TV Gardener's World programme, the presenter, Monty Don, was shown planting a variety of *R. rugosa* and “highly recommended” it for hedging. The programme made no mention of its invasive nature and associated international conservation problems.

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The use of remote sensing to assess elevation change on the North Norfolk Coast before and after the December 2013 storm surge

Jonathan Brownett^a, Rachael Mills^b, Sue Rees^b (a – Environment Agency, b – Natural England)

Natural England and the Environment Agency are working in partnership to improve the use of remote sensing in coastal environments, building on work started over a decade ago (Brown et al 2003). There is a range of data that can be used: true colour & near infrared aerial photos, CASI, LIDAR & optical and RADAR satellite data. These are collected from different platforms (aircraft, satellite & remotely piloted aircraft, combined with ground-based surveys). Using data captured at different times allows for change detection, which is increasingly used in coastal monitoring programmes. By using repeatable, objective methods such as LIDAR, a picture of coastal change can be developed. , Natural England is currently working with EA Geomatics to look at large scale elevation and morphological aspects of the coastal and intertidal environment. Coastal morphology underpins the habitats of biological importance in designated sites such as the North Norfolk Coast (OS grid ref TF 440693 to TG 095440).

All coasts undergo constant change, but extreme events can provide sudden and more visible shifts. The December 2013 storm surge highlighted the need to understand the scale and location of change, whether it was erosion or accretion, to help inform management responses. Where had eroded sediment gone and would it return through coastal processes over time?

The North Norfolk Coast is a large (7,700ha) protected site of European importance, designated for a range of biological and geomorphological features, so it is important to start understanding the nature of these sudden changes as a consequence of the surge event. The site includes intertidal, dune, shingle and wetland habitats and supports important bird populations. (More background information and location in <http://publications.naturalengland.org.uk/publication/5490707397607424?category=587130>). With a coastal frontage of around 35 km (May and Hansom 2003) this extensive barrier beach system has been closely studied by geomorphologists over the last century, and understanding ongoing change builds on this knowledge.

By analysing existing EA LIDAR data from February 2013 with new data captured in February 2014 (funded by Natural England), it was possible to analyse elevation change over the whole site. The intention is to assess this in the context of wider long term change, and looking at differences between more typical years.

This article introduces the methods used and technical issues arising, together with a sample of the elevation change product.

LIDAR (Light Detection And Ranging) elevation data is captured from Environment Agency aircraft. It uses a laser to measure the distance between the survey aircraft and the ground surface. This provides us with the ability to capture large areas quickly with a vertical accuracy in the range of 5cm to 15cm, with spatial resolutions ranging from 25cm to 2m. A number of products are made from the LIDAR, including Digital Surface Models (DSM), Digital Terrain Models (DTM) & intensity data. The DSM shows the

elevation of the surface and includes features like buildings and vegetation. The DTM is a bare earth model, which has had the building and vegetation features removed. The intensity data is the strength of the return LIDAR near infrared laser pulse; intensity values for water are normally low, making it possible to discriminate from other land cover classes. This change analysis used the last return DSM, which includes building features, however generally sees down through vegetation to the ground below. This dataset has the best coverage around the coast, and shows the maximum amount of ground surface possible without creating a DTM, with minimal errors in the analysis from vegetation changes.

Due to the size of the North Norfolk Coast the site was split into three sections for analysis. A methodology for checking and analysing this data was followed. This goes through steps to minimise and remove potential errors in the results. The first step in this analysis is to assess any systematic error between the elevations in the two datasets. This is carried out on hard flat surfaces such as car parks, where change is likely to only be from the error in the LIDAR system. This error was between 1– 6 cm for each section and the error value for each was used to snap the datasets together, minimising this error.

Water masks were made for each dataset using the elevation and intensity data from the LIDAR. A mask defining the intertidal zone was also created, through the use of the highest astronomical tide (HAT) height recorded at local tidal gauges. A third mask was also created defining the area of interest along the coastline above/behind the HAT, including frontal dune ridges, sea defence banks and shingle ridges.

By using these masks the site was split into zones, within which elevation change could be calculated. These zones are:

(1) Intertidal Only: only areas that were classified as exposed intertidal zone in both years. All areas of water were excluded.

(2) Intertidal – HAT: for areas where the elevation was greater than HAT in one year, but the area was exposed intertidal zone in the other.

(3) Coastal Only: for areas that were classified as above HAT in both years, or considered Coastal and Flood Plain Grazing Marsh according to Natural England's Priority Habitat Inventory.

(4) Intertidal – Water: for areas where water was present in one of the years, a separate change product was produced. In these areas the magnitude of change has been at least this much, with further changes likely but unknown due to being under the water level.

A number of procedures and checks were carried out on the change products for these zones to clean them. This includes identification and removal of boats, vegetation and for the Intertidal – Water product, removal of false change.

The water masks were used in conjunction with the change data to filter out false results by using them to check which

year the water was present. Any areas where water was present in 2014 and change detection showed erosion were kept in the analysis. In these areas there is at least this much erosion. Areas where water was present in 2014 and change showed accretion were removed from the analysis. In these areas it is not possible to calculate where the sediment level is in 2014. It could be that it is actually now below the level in 2013 and, if water was not present, erosion would be recorded here. The same principles were followed for areas of water in 2013. If these areas recorded accretion they were kept in the analysis and any areas of erosion were removed. In these areas there is at least that much accretion.

Boats, scrub and tree vegetation were all identified by calculating the difference between the LIDAR DSM and DTM. These were checked to confirm they were boats or vegetation and additional areas were added during this. Furthermore, using the Environment Agency Saltmarsh Extent inventory (Hambidge & Phelan 2013), all areas of saltmarsh were identified and excluded from the analysis. This minimises false change caused by growing/ cleared vegetation or moving boats.

This process and the quality control checks within it allow for the maximum extent of analysis to be carried out and true change to be accurately identified.

Below are 3 maps showing some examples from the change products created across the site.

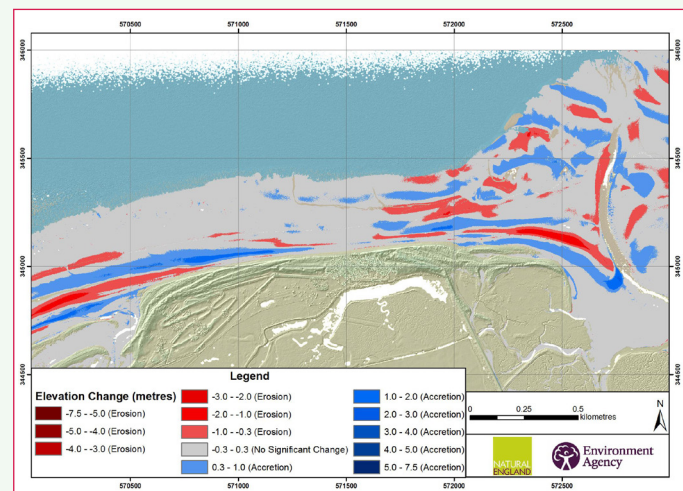


Figure 1: Holme Dunes Frontage – Intertidal Only Product. This shows the movement of sediment on the beach

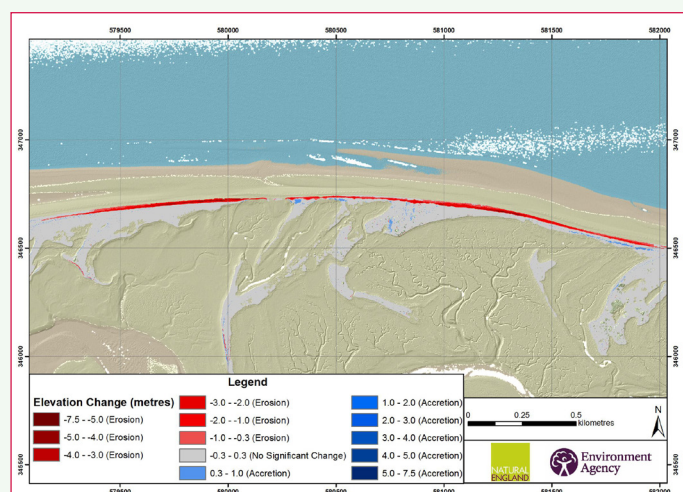


Figure 2: Scolt Head Island – Coastal Only Product. This shows erosion of the barrier island sand dunes

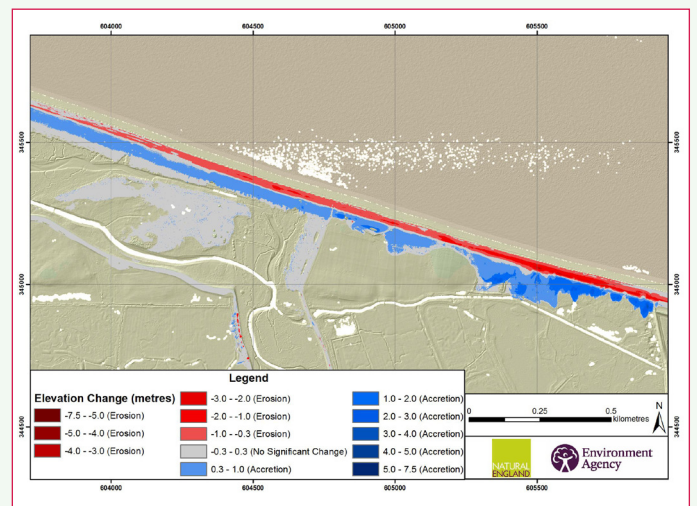


Figure 3: Blakeney & Cley next the Sea – Coastal Only Change Product. This shows the erosion of the front of the shingle ridge and new over wash fans accreting

The results are yet to be evaluated by Natural England and the Environment Agency for their geomorphological or ecological implications, and there are other products, including habitat mapping and volume change analysis, still to be completed as part of this work, which forms part of a wider joint programme.

The priority will be to use the completed products with coastal managers in Norfolk to inform condition assessment, management planning and storm recovery actions as well as a basis for assessing ongoing change. The final outputs and the imagery are available on request from Environment Agency, Geomatics.

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<https://www.geomatics-group.co.uk/GeoCMS/Homepage.aspx>

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Higher Level Stewardship: implementing conservation grazing at Ainsdale & Birkdale Sandhills Local Nature Reserve

Rachel Northover, Principal Coast and Countryside Officer, Sefton Council

Watching a recent episode of BBC 'Countryfile', it seemed to suggest that sheep grazing the dunes in Sefton was a bit unusual and it often surprises me that even local people are unaware that this management practice has been in place for nearly two decades on some sites.

Ainsdale & Birkdale Sandhills LNR is one of a suite of nature reserves within the Sefton Coast SSSI, which consists of 22 miles of coast managed under the Sefton Coast Landscape Partnership. The LNR is owned and managed by Sefton Council, and it has long been our goal to introduce livestock grazing on the fixed dune grassland (since 2000, 7.2ha have been grazed by Herdwick sheep from the flock on the adjacent National Nature Reserve – as seen on TV), to bring the SSSI units into favourable condition status, or to put it another way, endeavouring to restore and / or maintain these precious dune habitats for future generations.



Scrub clearance on Birkdale Hills, Sefton Council

The LNR is also public open space beloved by a wide range of people and their varied interests are often difficult to reconcile. To many conservationists, grazing is an effective and widely used tool for maintaining open habitats. Others argue that we should not be interfering, allowing the habitats to develop 'naturally' and letting the wild grazers (rabbits) do the work. The fact is that the rate of scrub incursion has been rapid over the past 20 years. Many people, even regular visitors, are unaware that the area was until recently much more open and see the removal of scrub and subsequent grazing as plain environmental destruction, an unacceptable intrusion in the landscape or even some sinister plan to turn the area into a farm to bring in revenue for the Council. But probably the biggest bugbear, particularly amongst dog walkers, is the perceived restriction on freedom to roam.

For us as land managers, there are other considerations, such as how to fund the management required to meet our legal duties. Budgets for Council-owned nature reserves have always been inadequate and are now an endangered feature themselves. For years, despite a generally positive response to the pilot scheme, the rolling out of grazing was put on the back burner. In 2004-2005, Natural England helped with scrub removal (concentrating on sea buckthorn) through WES

grants, enabling contractors to clear areas in the Birkdale frontal dunes and the Ainsdale Hills. Site staff with the help of volunteers struggled to maintain these areas scrub free. But the main compartment, Birkdale Hills, continued to fall further into unfavourable condition, with us just tickling the edges to keep the best slacks and Sand Lizard banks clear.

In 2008, the Sefton Coast Partnership developed a Landscape Partnership Scheme bid. At about the same time, the rules were changed on Higher Level Stewardship and applications from Local Authorities became possible. This made it financially feasible to implement the grazing project, as outlined in the Sefton Coast Nature Conservation Strategy (2006), beginning with a 3 year programme of scrub removal from the Birkdale Hills funded through HLF Landscape Partnership Scheme. Surprisingly, despite some initial opposition, the scrub removal has been less controversial than expected, with most people appearing to accept the arguments for clearance and being happy with the retention of modest areas of native successional woodland. One of the most difficult hurdles was getting an unconditional felling licence – Natural England and Forestry Commission were not completely in sync on this when it came to practicalities, regardless of the widely accepted deleterious effects of scrub woodland development on the SSSI.

Despite consultation on the project as part of the Nature Conservation Strategy and the Landscape Partnership Scheme, the HLS Agreement as accepted by the Council in 2010 did not go down well with everyone and a vigorous campaign was launched against the scheme. The argument is recorded within the Council's minutes. The opposition group questioned both the value of livestock grazing as a management tool and the validity of the agreement with Natural England thus initiating a full review by Natural England in 2012. Members of the Sand Dune and Shingle Network visited the site around this time and their advice and experience helped strengthen our belief that grazing the fixed dunes was the right management approach.

The revised HLS Agreement adopted by the Council includes some changes to the funding structure and to implementation. Bowing to concerns about the visual impact of fencing, the amount of fencing was reduced to two large enclosures instead of eight smaller ones. On a practical level stock will be ranging over a greater area which will affect stocking levels, time taken to undertake daily checks and visitors will be less able to avoid grazed areas should they wish to.

The HLS Agreement always stipulated that larger animals such as cattle and ponies could be used but the Council initially took the position that only sheep would be used feeling that this would be more acceptable to site users and easier to source and manage the animals. It could if needed be revisited later once people became accustomed to the practice. With the change in fencing, and pressure to make more of an impact given the late start of the grazing project, cattle have been introduced straight away, as a suitable local

source was at hand. The levels of grazing, by what and for how long over the winter have to be agreed annually with Natural England and information made available to site users prior to livestock arriving.



Cattle and sheep at Ainsdale, December 2014, Phil Smith

The revised Agreement puts more onus on the landowner to monitor the impact of grazing and to involve volunteers in monitoring. An Indicators of Success and Monitoring Plan

includes fixed point photography and permanent quadrats for vegetation surveys with training for volunteers. Alongside this is a Scrub Management Plan, to be agreed each year with Natural England. These additions should promote greater openness and dialogue between those charged with managing the SSSI and those who disagree with the principles and techniques adopted.

At the time of writing, we have grazed our second enclosure on Ainsdale Hills (31ha) with 15 cattle (Shorthorn and Belted Galloway) and finished fencing the enclosure on Birkdale Hills (62ha). We have had plenty of positive comments, especially following a 'Meet the Grazers' event. By October 2015, I hope to be able to report that we have cattle and perhaps sheep grazing on Birkdale Hills for the first time in living memory and have trained volunteers as 'lookers' and as vegetation surveyors to assist the Coast & Countryside team.

Acknowledgements – Margaret Dickinson from Natural England, Sand Dune and Shingle Network members for their valuable input, past and present Coast & Countryside and Sefton Coast Landscape Partnership staff, and everyone who has contributed to managing the Ainsdale & Birkdale Sandhills LNR to date (quite a long list).

Sea Buckthorn *Hippophaë rhamnoides*: native, non-native? Do we need to know?

Its past and future management at Aberlady Bay Local Nature Reserve, East Lothian

John Harrison, Warden, Aberlady Bay Local Nature Reserve



Sea Buckthorn berries *Hippophaë rhamnoides*.
John Harrison

Sea buckthorn has been present in East Lothian for a long time. The earliest known record is of it occurring 'abundantly' near Gosford in 1824 (Groves, 1958). Martin (1934) records the species from a number of sites in the County, including Aberlady Bay, and doesn't include the plant in the list of non-natives. Sea buckthorn has, unquestionably, been planted in East Lothian, including extensive planting at Gullane from the mid-1950s. And so evidence suggests that there may be two populations of the plant in the County and at the nature reserve: one native

and one introduced. However, if introduced then from where was the seed sourced? Locally would seem most obvious and, if so, is it then native?

There is a much higher proportion of female sea buckthorn plants than male at the site. This would suggest un-natural origins as a more even ratio would be expected in the wild. More female plants than male were planted at Gullane, as occurs in commercial situations. These berries are a valuable food source (with counts of over 3,000 fieldfare *Turdus pilaris* in the past) and the scrub is the sole nesting habitat for a number of bird species, including lesser whitethroat *Sylvia curruca* and bullfinch *Pyrrhula pyrrhula*. The benefits and detriments to wildlife of sea buckthorn have been well-described elsewhere but suffice it to say that much evidence of both is here to see at the nature reserve.

Sea Buckthorn has spread dramatically at Aberlady Bay since it was first mapped in 1977 covering around six hectares. Over the next 30 years it almost trebled in area, and this in spite of several hundred hours spent controlling it each year from the early 1980s. This rate of spread was not equal across the site: some areas have changed relatively little over this period, whereas others have increased dramatically and new patches have established.

In 2008, a new control strategy was developed by East Lothian Council (who have managed the site since its

designation in 1952) aiming to halt the plant's advances through use of heavy machinery, herbicides and increased people power. Sea buckthorn patches were assessed on ten criteria (considering the rate of its spread, the size of the patch, the importance of the grassland habitat surrounding it, and the patch's value for key wildlife) and control targeted accordingly. This has been largely successful with nearly all small to medium size patches removed and its overall extent reduced to less than 12 hectares.



Volunteers clearing Sea buckthorn. By John Harrison

So what future should sea buckthorn have at Aberlady Bay? Should we eradicate it as a highly invasive alien or should we retain this EU Habitat 2160 in some form, as a natural part of the coastal dune system? Coastal dune grassland is the key habitat feature of the two but could they co-exist here?

If we knew that all the plants were introduced then this would make the decision easy. It is highly likely that this will not be established and so East Lothian Council's current position is that we continue to clear sea buckthorn from areas of important sand dune habitat and will retain patches within other grassland areas of less conservation interest. As we learn more, we will be able to decide better on how much, if any, sea buckthorn to retain in the future.

John Harrison, Warden, Aberlady Bay Local Nature Reserve

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The effect of the December 2013 tidal surge on the wildlife of Blakeney Point

Richard Porter and Ajay Tegala, National Trust, Blakeney Point

On the evening of Thursday 5 December 2013 a major tidal surge hit the coast of north Norfolk. Caused by high atmospheric pressure in the northern North Sea, a huge volume of water was pushed south into an area of low pressure off East Anglia. This resulted in widespread flooding as a wall of water, of at least two metres above the normal high tide level, swept onto the shore, overtopping the dunes and sea defences in a number of places. Following the surge the sea retreated fairly rapidly.

In 2014 surveys were undertaken to monitor mammals, breeding and migrant birds, butterflies and plant distribution. The data were compared to those collected systematically for at least the previous ten years. Changes to the habitats of Blakeney Point were also assessed. The Grey Seal breeding colony, which was active at the time of the surge, was monitored carefully.

This is an extract from a paper that will be published in the 2014 *Transactions of the Norfolk and Norwich Naturalists*.

Changes to habitats

The most noticeable changes were caused by massive shingle deposition along the shingle ridge, which deposited up to an estimated 1.5m of shingle over the existing shingle. The seaward edge of the dunes were scoured

to a width of at least two metres and the erosion and wind-blown sand resulted in extensive fans of sand being deposited over Beach Way, turning them into a lunar-like landscape.

Along the beach masses of Sea-purslane *Atriplex portulacoides* had been deposited along the tideline, along with branches of pine trees *Pinus sp.* These had almost certainly been brought from East Hills/Holkham Woods to the west.

Grey Seals

The tidal surge occurred at the height of the Grey Seal breeding season on Blakeney Point. Two days prior to the surge, 1,223 pups were counted, most of them less than a month old and totally dependent on their mothers' milk. Their location on the westernmost section of the Point put them in the face of the surge and we expected many would be displaced. However, only three pups were found stranded without their mothers; one at Morston and two at Cley. It was two days after the surge that we were able to get out to the Point. Approximately five pups had been displaced, ending up near the Lifeboat House and Plantation, but were with their mothers. A pup count recorded 1,235 in the main breeding area, 12 more than the previous count. Although the exact response by the

seals during the surge is unknown, it is presumed that they found their way to the taller dunes that were not flooded. The colony went on to have its best breeding season to date, with a total of 1,566 pups born and the usual 95% raised to weaning.



Seals at Blakeney Point, John Houston

Breeding birds

The tidal surge caused vegetation on the main ridge to be over-topped with shingle. At the beginning of the breeding bird season, the ridge was still barren. There was concern that this may have a negative impact on ground-nesting birds that need vegetation to provide cover for their young.

Oystercatchers are showing a gradual decline which appears to have increased between 2013 and 2014. The lack of vegetative cover on the ridge is a possible explanation although Oystercatchers have experienced a very low young survival rate in recent years. Ringed Plovers did not appear to be affected by the surge. There was one less breeding pair than in 2013 and productivity was higher in 2014.

By the time Little Terns nesting on the ridge had young, Sea Sandwort was abundant and was utilised. Their numbers and productivity typically fluctuate greatly as so many factors have a bearing on their success; predation, disturbance, food availability and weather – all of which were experienced during the 2014 season.

Sandwich Terns probably benefited from the surge, unlike in 1953 when just 51 pairs nested due to unsuitable nesting sites. In 2013, the colony had moved out of its usual area on to the thin tip of Far Point due to overgrowth of *Suaeda* but the surge buried much of this. Perhaps in response to this, in 2014 the colony returned to its usual location next to the Black-headed Gulls. The surge created a shingle ridge to the north of the *Suaeda* in which the gulls nest, this ridge conveniently gave nesting Sandwich Terns a view over them, perhaps making them feel more comfortable to nest there. 2,859 pairs bred in 2014 and for the first time, a sub-colony of 154 nesting pairs formed on the tip of Middle Point, a shingle 'island'. This may be linked to fox disturbance and predation in the main colony, rather than a change in habitat, as foxes were also the cause of lower breeding pairs and productivity.

Breeding pairs of Grey Partridges increased on Blakeney Point between 2008 and 2013, rising from three to nine pairs. In 2014, numbers dropped to seven pairs. Counts in January peaked at 20 in 2014, compared to 25+ in 2013. This may be related to predation. However, there was a definite decrease in fledged young (in winter 2012/13 over 40 birds were present in the dunes, in 2014/15 there were just eight) perhaps linked to food. The tidal surge may have led to a decrease in ground invertebrates, leading to starvation of young.

Wintering birds

In November 2013, up to 77 Snow Buntings were present. Some 40+ were observed on 2 December. Snow Buntings were absent from the Point for ten days after the surge, with just 13 seen on 15 December. The peak count for January 2014 was just 9. It would seem the lack of available seeds to feed on led to the decline in Snow Buntings. The surge pushed the shingle ridge inland, burying the Curled Dock and Yellow Horned-poppy seeds.

Throughout November 2013, a flock of seven Shorelarks were present on Far Point. Following the surge, no Shorelarks were seen on the Point until 3 February 2014, when a group of three were recorded, they stayed into mid-March, suggesting there was sufficient food to support this small number for a period of six weeks, two months after the surge.

For other passerines it was nearly two months – to the end of January 2014 - before any were seen feeding on the Point as the tidal surge had probably washed away the weed seeds that collect on the sand and shingle, especially on the inner tide-line. Even during February 2014 numbers remained much lower than in normal winters. However by the following winter of 2014/2015 numbers of feeding passerines appeared to be back to normal.

Butterflies

The tidal surge appeared to have adversely impacted the breeding populations of two species of butterfly, Small Copper *Lycaena phlaeas* and Common Blue *Polyommatus icarus*. The December 2013 surge deposited deep shingle over the breeding areas of these species, with numbers crashing by 90% and 70% respectively in 2014 from the 2013 population, despite 2014 being a warm summer.

The Small Copper and Common Blue have their main population on the vegetated areas of the shingle ridge. The food plants of the larvae of these two species were smothered by shingle as were nectar-producing flowers on which the adults feed. The populations of Grayling *Thymallus thymallus* and Gatekeeper *Pyronia tithonus* were much less reduced, probably reflecting the more dune-orientated distribution of Grayling and the higher areas with Brambles *Rubus fruticosus* in the case of the Gatekeeper.

www.norfolkcoastnationaltrust.blogspot.co.uk

News from around the network

Ayres NNR, Isle of Man

The Ayres National Nature Reserve is located on the north-west coast of the Isle of Man. The 272 hectare reserve is situated on a raised beach. Extensive areas of lichen heath have colonised the thin, nutrient deficient soils over-laying the raised beach. The reserve includes a 1km stretch of sand dune and shingle habitats although these continue well past the boundary of the NNR. Specialties for the reserve include: a growing little tern colony and breeding Arctic terns, ringed plover, oystercatcher, curlew, skylark, meadow pipit and stonechat. Twenty-six nationally scarce invertebrates have been recorded including the scarce crimson and gold moth *Pyrausta sanguinalis* and the heath bee-fly *Bombylius minor*.



Ayres NNR Heath, Louise Samson

From January to April 2014 the reserve experienced the worst floods in living memory and 25% of the reserve was underwater. This destroyed 16% of the lichen heath and early marsh orchid, northern marsh orchid and common twayblade failed to show in the summer.

Louise Samson, Forestry Warden, Isle of Man government Louise.Samson@gov.im

Dynamic changes on Tentsmuir Point!



The old Observation tower on Tentsmuir Point, Tom Cunningham

The weekend of high tides and strong winds have re-sculpted the foreshore & dune landscape once again.

17 years ago during Christmas week 1998, the WWII Observation Tower built in 1940 fell into the sea, the dune eroded away by the sea. Several months later it was buried under the accreting sands. Astonishingly, this week (February 25th 2015 NB Editor) the remains were exposed as the tides and winds plucked the sands away some 100 metres out from the dune edge. Bringing back memories of when I first started work here. It's funny how times have changed and my memories were nearly as good as I had remembered. The distance between the Observation Tower and the WWII Command Post (the green hut on concrete stilts) seemed closer. Now the foreshore has built up higher as you can see from the images.

Tom Cunningham, Reserve Manager, Tentsmuir National Nature Reserve, Scottish Natural Heritage

News from Wales

Dune rejuvenation project enters second phase

Thanks to funding from SITA Trust, Natural Resources Wales has continued its dune rejuvenation works on Kenfig, Merthyr Mawr Warren and Newborough Warren National Nature Reserves over winter 2014-2015. A full update will be provided in due course.



Restoration of Newborough Warren Sand Dunes, Natural Resources Wales

Over the last 60 years Newborough Warren on Anglesey has lost a staggering 94% of open, mobile sand dunes as they became over-grown with grass and trees. This destroyed the unique pioneer dune slacks necessary for the specialist and rare wildlife of the dunes to flourish. Natural Resources Wales has already removed dead or stunted trees from two small areas behind the dunes. Now it will begin the second phase of the project by removing vegetation from some dunes and cutting notches in the frontal dunes so that the sand can move about naturally in the wind. This will help rare plants and insects such as petalwort, sand wasps, mining bees and rare beetles that have been driven to the brink of extinction in the area.

<http://naturalresourceswales.gov.uk/about-us/media-and-news-centre/press-release/restoring-newborough-sand-dunes/?lang=en>

Graham Williams, Warden, Newborough Warren and Dr. Mike Howe, Invertebrate Ecologist

Events

More than just publishing details of events we highlight several opportunities for members of the UK and European Dune Networks to meet and be inspired by ground breaking projects. Several international and UK events are organised from 2015 to 2017, with some linked to EU LIFE Nature projects. These meetings all offer an excellent opportunity for the exchange of experience.

EUCC-France International Conference, Biarritz, 22nd-23rd June 2015

EUCC-France are organising an international conference in Biarritz the 22nd and 23rd of June 2015. The theme of the event is European coasts and climate change: Biodiversity response and new management strategies in coastal environment.

It will be devoted to:

- *Coastal management strategies in Europe*
- *Biodiversity and climate change*
- *Risk management of erosion / flooding in Europe*

See the link for more information:

<https://euccbiarritzen.wordpress.com/>

RGS-IBG Annual International Conference, Exeter, UK 1st-4th September 2015

The Coastal and Marine Research Group of the Royal Geographical Society (with IBG) are proposing a number of sessions for inclusion at the RGS-IBG Annual Conference in Exeter in September this year. The theme of this year's conference is: Geographies of the Anthropocene (<http://www.rgs.org/WhatsOn/ConferencesAndSeminars/Annual+International+Conference/Conference+theme.htm>)

The Coastal and Marine Research Group sessions will be on: 'Place, Space and Conflict' and 'The Blue Economy: the Balance between industry and Conservation'.

See the link for more information:

<https://coastalmarineresearchgroup.wordpress.com/conferences-events/>

Dunes and Estuaries 2015: Restoration of Tidal & Estuary Areas - Bruges, Belgium - 16th-18th September 2015

This conference is being organised in the context of ZTAR, a European co-funded LIFE-project in the Zwin-area on the Belgian coast. This is an abbreviation for 'Zwin Tidal Area Restoration' and is a cross-border LIFE nature project. This European project aims at restoring the Zwin plain and is being implemented by the Nature and Forest Agency of the Flemish Government, in collaboration with the Dutch Province of Zeeland. The project officially started on 1st January 2011 and will be finalized by 31st December 2015. The conference is held as the final event of the LIFE Nature project ZTAR.

Topics:

- *Ecosystem services of estuary and coastal areas*
- *EU-Life-projects with respect to estuary and coastal areas*
- *Climate change*
- *Depoldering of coastal areas*
- *Ecological development and management of estuarine areas*

See the link for more information:

<http://www.natuurenbos.be/nl-BE/over-ons/projecten/Ztar/Conference%20Dunes%20and%20Estuaries%202015>

Dynamic Dunes, 7th-9th October 2015, Holland

PWN, Natuurmonumenten and Waternet hereby invite you to the international congress about rejuvenation of dynamic dunes and restoration of the dune habitats. The congress will be organized within the framework of Dutch Dune Revival (LIFE 09 NAT/NL/418) and Amsterdam Dunes, Source for Nature (LIFE 11 NAT/NL/776). The congress will take place near Amsterdam from October 7-9, 2015. Part of the congress will be visits to 'Noordwest natuurkern', finalist project of the EU-award 2014 and beautiful grey dunes in autumn sunshine. Please reserve this date.

Program Information:

- *Overview dynamic dune management*
- *Workshops Dutch coastal management, daring Dutch approach, aftercare management*
- *Fieldtrips dynamic dune National Park Zuid-Kennemerland*
- *Overviews of the restoration of Grey Dunes*
- *Workshops invasive alien species management, mosaic management*
- *Fieldtrips Amsterdam Dunes or National Park Zuid-Kennemerland*
- *Introduction Dutch Dune Revival*
- *Fieldtrip Voornes Duin*

See the link for more information:

<http://www.pwn.nl/dynamicdunes>

12th European Dry Grassland Meeting, Mainz, Germany, 22-27 May 2015

Palaearctic dry grasslands have a long tradition of community analysis and description, leading to a detailed picture of these habitats, especially in Central Europe. In contrast, research on the biology of species and populations, such as pollination biology, dispersal ecology, demography or population genetics, is expanding rapidly. The connection between the two scientific disciplines is often weak although, actually, populations are part of communities and communities consist out of populations. We will therefore focus on this connection between population biology and community ecology for all dry grassland biota (invertebrates, vertebrates, non-vascular plants, vascular plants, fungi and lichens) as the overall topic of the next EDGM.

Specific topics of the conference:

- *Population biology of dry grassland species*
- *Diversity and community ecology of dry grasslands*
- *Management and conservation of dry grasslands*
- *Socio-cultural aspects of dry grasslands*

The European Dry Grassland Meetings are organised annually by the European Dry Grassland Group (EDGG, <http://www.edgg.org>), a network of dry grassland/steppe researchers and conservationists from all disciplines. EDGG is affiliated with the IAVS (International Association for Vegetation Science) as a Working Group as well as with the EFNCP (European Federation for Nature Conservation and Pastoralism), and membership is free of charge.

See the link for more information:

http://www.edgg.org/edgg_meeting_2015.html

Littoral 2016, Biarritz, France

Provisional dates for this event are 23rd – 26th October 2016. The conference theme is expected to be “The changing littoral. Anticipation and adaptation to climate change” - “*Littoral en devenir. Anticiper et s'adapter au changement climatique*”. The proposed themes are ‘State of the art knowledge on sea-level rising’, ‘Coastal environment conservation’, ‘Integrated coastal zone management’, ‘Sustainable development in coastal zone’, ‘Coastal engineering’ and ‘Fishing and aquaculture’. It is anticipated that there will be a workshop on coastal dunes. The official language will be English. More details to follow from EUCC-France.

Littoral 2017, Liverpool Hope University, Liverpool, UK

Dates for this event are Monday 4th until Thursday 7th September 2017. The conference theme is ‘*The anthropocene and the littoral - change, naturalness and people*’. The anthropocene is claimed by some to be a new geologic epoch, one in which people are now the greatest force shaping the Earth. The theme of Littoral 2017 will explore how humans and human processes influence the littoral, and how these influences may now be viewed as being natural, as much any other natural processes. The theme will gather all disciplines to explore current issues of relevance to the coast. It will be of interest to a wide spectrum of scientists, including those from the physical sciences, climate change scientists and ecologists, social scientists, engineers, policy makers and advisers and practitioners. It is a theme that is of broad geographical interest.

The Liverpool city region is of international importance with the Dee Estuary SAC, Mersey Estuary SAC, Sefton Coast SAC and the Ribble Estuary SAC all within a very short travel time of the conference venue. The coast of Liverpool offers an amazing combination of near-natural estuary and sand dune wildscapes that contrasts starkly with an urban coastline and one of the busiest port complexes in Europe. With an international perspective and exceptional economic strengths, Liverpool is recognised as one of the UK's leading business, leisure and tourism destinations. More details to follow on this event, but please contact Paul Rooney on dunes@hope.ac.uk for more details.

The Riddle of the Landguard Shingle



Ringed Plover and two chicks, Alan King

I can be two millimetres to two hundred
Swash and Wash formed me over the millennia
Pounded by the waves, smoothing my edges, along the
shore I drift
Building my dips and ridges along the way
When at last I'm stable cabbage like plants grow upon my
surface
With roots two metres long, no wind can tear them from me

And fresh water can be found in my pockets at that depth
Other plants, including a pea like one grow here too
But I am no allotment!
And on my shelves and slopes of stones come April
A dumpy bird, brown and white, with black rings lay its eggs
Both parents taking turns to keep the eggs quite warm
This habitat that they have chosen
As rare as the proverbial Hens Teeth
Found chiefly on the coasts of North West Europe, Japan
and New Zealand
And when the Sea Kale, Sea Pea, Vipers Bugloss
And Yellow Horned Poppy, flower and
Help hide the scuttling Ringed Plover chicks.
Then you will know, that I am not just any old shingle
I'm Coastal Vegetated Shingle!

So come all you visitors and make a B- line; cross me quickly
getting to the Foreshore
And please don't crush my Sea Pea please, while sitting
having tea!

Chris Ryde, Ranger,
Landguard Nature Reserve, Suffolk
www.discoverlandguard.org.uk

Recent Publications

Flora/Fauna

Badgley E.M., Grubisha L.C., Roland A.K., Connolly B.A and Klooster M.R. (2015) Microsatellite Marker Development for the Coastal Dune Shrub *Prunus Maritima* (Rosaceae). *Applications in Plant Sciences* **3** (2) 1-3

Johnson M.D. and De León Y.L. (2015) Effect of an Invasive Plant and Moonlight on Rodent Foraging Behavior in a Coastal Dune Ecosystem. *PLoS ONE* **10**(2)

Mendoza-González G., Martínez M.L. and Lithgow D. (2014) Biological Flora of Coastal Dunes and Wetlands: *Canavalia rosea* (Sw.) DC. *Journal of Coastal Research* **30**(4) 697-713

Monge, J.A. and Gornish, E.S. (2015) Positive species interactions as drivers of vegetation change on a barrier island. *Journal of Coastal Research* **31**(1) 17-24

Rodríguez-Echeverría S., Roiloa S.R, de la Peña E., Crisóstomo J.A and Nabais C. (2015) Transplanting native woody legumes: a suitable option for the revegetation of coastal dunes. *Ecological Research* **30**(1) 49-55

Management and Monitoring

Bogle R., Redsteer M.H. and Vogel J. (2015) Field measurement and analysis of climatic factors affecting dune mobility near Grand Falls on the Navajo Nation, southwestern United States. *Geomorphology* **228** 41-51

Hu F., Shou W., Liu B., Liu Z. and Busso C.A. (2015) Species composition and diversity, and carbon stock in a dune ecosystem in the Horqin Sandy Land of northern China. *Journal of Arid Land* **7**(1) 82-93

Kilibarda Z. and Shillinglaw C. (2014) 70 year history of coastal dune migration and beach erosion along the southern shore of Lake Michigan. *Aeolian Research In Press*

Lithgow D., Martínez M.L. and Gallego-Fernández J.B. (2014) The "ReDune" index (Restoration of coastal Dunes Index) to assess the need and viability of coastal dune restoration. *Ecological Indicators*. **49** 178-187

Rudgers, J.A, Bell-Dereske, L., Crawford K.M. and Sarah M. Emery. (2015) Fungal symbiont effects on dune plant diversity depend on precipitation. *Journal of Ecology* **103** 219-230

Silambarasan K. and Senthilkumaar P. (2015) Distribution and Diversity of Coastal Sand Dunes (CSD) of Marakkanam Coastal Belts, Southeast Coast of India. *Species* **12**(35) 101-105

Vecchio S.D., Prisco I., Acosta A.T.R. and Stanisci A. (2015) Changes in plant species composition of coastal dune habitats over a 20-year period. *AoB Plants* 1-33

Modelling

Houser C., Wernette P., Rentschlar E., Jones H., Hammond B. and Trimble S. (2015) Post-storm beach and dune recovery: Implications for barrier island resilience. *Geomorphology*. **234** 54-63

Liu B. and Coulthard T.J. (2015) Mapping the interactions between rivers and sand dunes: Implications for fluvial and Aeolian geomorphology. *Geomorphology*. **231** 246-257

Mull J. and Ruggiero P. (2014) Estimating storm-induced dune erosion and overtopping along U.S. West Coast beaches. *Journal of Coastal Research*. **30**(6) 1173-1187

This newsletter has been compiled by John Houston, Paul Rooney and Emily De Noia

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Cover Photo: Cows grazing at Ainsdale, Merseyside. ©Dave McLeavy

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